

Docket No. F-7899

Ser. No. 10/630,429

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1-7. (Cancelled)

8. (Previously Presented) A bearing device comprising:

a shaft body; and

a rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out,

wherein said inner ring of said rolling bearing is entirely hardened by heat treatment in order to improve abrasion resistance and strength of a raceway surface defined by said inner ring, and

wherein a peripheral region of an inner peripheral corner of said inner ring is low-hardened by local quenching after said heat treatment.

9. (Currently Amended) A bearing device comprising:

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a shaft body; and

a rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out, an end surface of said inner ring constituting a crimp contact portion in contact with said caulked portion.

wherein hardness of a peripheral region of an inner peripheral corner of said inner ring is set to a value capable of plastically absorbing a load at the time of caulking; and

~~The bearing device according to claim 7,~~ wherein said inner peripheral corner of said inner ring is roundly chamfered with a predetermined radius of curvature, said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is equal to or greater than said predetermined radius of curvature and wherein a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set equal to or less than that of at least said peripheral region of said raceway surface of said inner ring.

10. (Cancelled)

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11. (Currently Amended) A bearing device comprising:

a shaft body; and

a rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out, an end surface of said inner ring constituting a crimp contact portion in contact with said caulked portion,

wherein hardness of a peripheral region of an inner peripheral corner of said inner ring is set to a value capable of plastically absorbing a load at the time of caulking;

wherein said inner peripheral corner of said inner ring is roundly chamfered with a predetermined radius of curvature; and

~~The bearing device according to claim 10,~~ wherein said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is equal to said predetermined radius of curvature and a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set less than ~~equal to~~ that of at least said peripheral region of said raceway surface of said inner ring.

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12. (Currently Amended) A bearing device comprising:
a shaft body; and
a rolling bearing which is mounted around said shaft body,
wherein said shaft body is provided at its free end with a caulked portion, said
caulked portion being bent outward in a radial direction for pushing an end face of
an inner ring of said rolling bearing thereby preventing said rolling bearing from
falling out, an end surface of said inner ring constituting a crimp contact portion in
contact with said caulked portion,
wherein hardness of a peripheral region of an inner peripheral corner of said
inner ring is set to a value capable of plastically absorbing a load at the time of
caulking;
wherein said inner peripheral corner of said inner ring is roundly chamfered
with a predetermined radius of curvature; and

~~The bearing device according to claim 10,~~ wherein said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is greater than said predetermined radius of curvature and wherein a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set less than equal to that of at least said peripheral region of said raceway surface of said inner ring.

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13. (Currently Amended) A bearing device comprising:
a shaft body; and
a rolling bearing which is mounted around said shaft body,
wherein said shaft body is provided at its free end with a caulked portion, said
caulked portion being bent outward in a radial direction for pushing an end face of
an inner ring of said rolling bearing thereby preventing said rolling bearing from
falling out, an end surface of said inner ring constituting a crimp contact portion in
contact with said caulked portion,
wherein hardness of a peripheral region of an inner peripheral corner of said
inner ring is set to a value capable of plastically absorbing a load at the time of
caulking;
wherein said inner peripheral corner of said inner ring is roundly chamfered
with a predetermined radius of curvature; and

The bearing device according to claim 10, wherein said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is equal to said predetermined radius of curvature and wherein a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set less than that of at least said peripheral region of said raceway surface of said inner ring.

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14. (Currently Amended) A bearing device comprising:a shaft body; anda rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out, an end surface of said inner ring constituting a crimp contact portion in contact with said caulked portion,

wherein hardness of a peripheral region of an inner peripheral corner of said inner ring is set to a value capable of plastically absorbing a load at the time of caulking;

wherein said inner peripheral corner of said inner ring is roundly chamfered with a predetermined radius of curvature; and

~~The bearing device according to claim 10,~~ wherein said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is greater than said predetermined radius of curvature and wherein a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set less than that of at least said peripheral region of said raceway surface of said inner ring.

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15-16. (Cancelled)

17. (Currently Amended) A bearing device comprising:a shaft body; anda rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out, an end surface of said inner ring constituting a crimp contact portion in contact with said caulked portion,

wherein hardness of a peripheral region of an inner peripheral corner of said inner ring is set to a value capable of plastically absorbing a load at the time of caulking;

wherein said inner ring has a variable hardness; and

~~The bearing device according to claim 16,~~ wherein said peripheral region of said inner peripheral corner of said inner ring has a Vickers hardness of 400 or less at a surface layer and a peripheral region of a raceway surface defined by said inner ring has a Vickers hardness of 500 or more.

18. (Currently Amended) A bearing device comprising:

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a shaft body; and

a rolling bearing which is mounted around said shaft body,

wherein said shaft body is provided at its free end with a caulked portion, said caulked portion being bent outward in a radial direction for pushing an end face of an inner ring of said rolling bearing thereby preventing said rolling bearing from falling out,

wherein hardness of a peripheral region of an inner peripheral corner of said inner ring is set to a value capable of plastically absorbing a load at the time of caulking,

wherein said inner peripheral corner of said inner ring is roundly chamfered with a predetermined radius of curvature, said peripheral region of said inner peripheral corner is set as a region where a depth from said inner peripheral corner is equal to or greater than said predetermined radius of curvature, and

wherein a peripheral region of a raceway surface of said inner ring does not overlap, and hardness of said inner peripheral corner peripheral region is set ~~equal~~ to or less than that of at least said peripheral region of said raceway surface of said inner ring.